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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/532,922	03/22/2000	Bruce Emerson Wilcox	8993/108	8556
7590	10/15/2004		EXAMINER	
David E. Bennett Coats & Bennett 1400 Crescent Green, Suite 300 Cary, NC 27511			LY, NGHI H	
			ART UNIT	PAPER NUMBER
			2686	

DATE MAILED: 10/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/532,922	WILCOX ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Nghi H. Ly	2686

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 30 June 2004.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 33-38 and 56 is/are allowed.
- 6) Claim(s) 1-32 and 39-55 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) <i>g</i>	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### ***Response to Amendment***

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 7-14, 17-20, 22-26, 28-30, 39-44, 47-49, 51, 52 and 55 are rejected under 35 U.S.C. 102(e) as being anticipated by Rapeli et al (US 6,195,559).

Regarding claims 1, 26 and 39, Rapeli teaches a multiple antenna system (see fig.4, antennas 30-34), comprising: first and second antennas (see fig.4, antenna 34), a first signal circuit operatively connected with said first antenna via a first signal path (see column 5, lines 63-65, "receive and transmit branches of the secondary radio station 5 is well known and not shown in details here". In addition, Applicant's specification page 6, lines 10-12 disclose that "the signal circuit 210 and 220 can be transmitter, receiver, or transceiver") and a second signal circuits simultaneously operatively connected with said second antennas via a second signal paths (see column 5, lines 63-65, "receive

*and transmit branches of the secondary radio station 5 is well known and not shown in details here".* In addition, Applicant's specification page 6, lines 10-12 disclose that "the signal circuit 210 and 220 can be transmitter, receiver, or transceiver"), a first parallel tuning circuit selectively connectable in parallel with the first signal path (see fig.4, antenna 34 and parallel tuning circuit Zm1 and Zm2, and switches 62 and 63 for tuning circuit selectively connectable in parallel with the first signal path), the first parallel tuning circuit selectively adjusting the impedance of the first antenna (see fig.4, antenna 34 and parallel tuning circuit Zm1 and Zm2, and switches 62 and 63 for tuning circuit selectively connectable in parallel with the first signal path, and see column 6, lines 4-15).

Regarding claim 2, Rapeli further teaches a third antenna connected with a third signal source via a third signal path (see fig.4, antennas 30-34).

Regarding claim 3, Rapeli further teaches the first and second signal circuits are capable of generating electromagnetic signals (see fig.1, electromagnetic signals from the wireless device 5).

Regarding claim 4, Rapeli further teaches the electromagnetic signals include radio frequency signals (see fig.1, electromagnetic signals from the wireless device 5 and the electromagnetic signals of Rapeli inherently include radio frequency signals).

Regarding claim 7, Rapeli further teaches the first and second antennas are fabricated on a common dielectric material (see column 4, lines 52-54, "being ceramic disk").

Regarding claim 8, Rapeli further teaches an antenna housing capable of housing at least the first and second antennas (see column 4, lines 52-54, "antenna 8 comprising a set of selectable antennae 30-34").

Regarding claim 9, Rapeli further teaches the second signal circuit is capable of generating signals in multiple frequency bands (see fig.6, frequencies f1 and f2).

Regarding claim 10, Rapeli further teaches the first parallel tuning circuit increases the electromagnetic isolation between the first and second antennas (see column 4, lines 57-67, "electromagnetic") in multiple frequency bands (see fig.6, frequencies f1 and f2).

Regarding claims 11 and 42, Rapeli further teaches the first parallel tuning circuit includes an impedance matching circuit (see fig.4, Zm1 and Zm2).

Regarding claims 12, 28 and 43, Rapeli further teaches the impedance matching circuit matches an impedance (see fig.4, "matching impedances" of Zm1 and Zm2) of the second antenna via electromagnetic coupling (see column 4, lines 57-67, "electromagnetic coupling") with the first antenna.

Regarding claim 13, Rapeli further teaches the impedance matching circuit matches an impedance of the second antenna (see column 6, lines 11-15, "which used to match one antenna at a time to the transceiver circuit" and fig.4, "matching impedances" of Zm1 and Zm2).

Regarding claims 14 and 44, Rapeli further teaches the first parallel tuning circuit (fig.4, a parallel tuning circuit includes Zm1 and Zm2) includes a plurality of impedance matching circuits (fig.4, "matching impedances" of Zm1 and Zm2), each impedance

matching circuit being independently selectively connectable in parallel to the first signal path (see fig.4, two switches 62 and 63 are connected in parallel, and see two connections between two switches 62 and 63 and programmed control arrangement 61 for *independently selectively connectable*).

Regarding claim 17, Rapeli further teaches the first tuning circuit is selectively connectable to the first signal path near the first antenna (see fig.4, two switches 62 and 63 connect with antenna 34).

Regarding claims 18 and 47, Rapeli further teaches the first tuning circuit creates an impedance at an input of the first antenna substantially equivalent to an open circuit at the transmission frequency of the second antenna (see column 6, lines 11-15, "which used to match one antenna at a time to the transceiver circuit" and fig.4, "matching impedances" of Zm1 and Zm2).

Regarding claims 19 and 48, Rapeli further teaches the first parallel tuning circuit includes a plurality of band tuning circuits, each band tuning circuit being independently selectively connectable with the first signal path (see fig.4, two switches 62 and 63 are connected in parallel, and see two connections between two switches 62 and 63 and programmed control arrangement 61 for *independently selectively connectable*).

Regarding claims 20 and 49, Rapeli further teaches each band tuning circuit creates a different impedance (see fig.4, impedances Zm1 and Zm2) at an input to the first antenna associated with the connection to the first signal circuit (see fig.4, two switches 62 and 63 connect with the signal path of antenna 34).

Regarding claims 22 and 51, Rapeli further teaches the first parallel tuning circuit comprises an adjustable impedance based on selectively connecting different ones of the plurality of band tuning circuits with the first signal path (see fig.4, two switches 62 and 63 are connected in parallel, and see two connections between two switches 62 and 63 and programmed control arrangement 61 for *independently selectively connectable*).

Regarding claims 23 and 52, Rapeli further teaches a detector to control selective connection of individual ones of the plurality of band tuning circuits with the first signal path (see fig.4, two switches 62 and 63 are connected in parallel, and see two connections between two switches 62 and 63 and programmed control arrangement 61 for *independently selectively connectable*).

Regarding claim 24, Rapeli further teaches the first signal source includes a radio transceiver (see column 5, lines 63-65, "receive and transmit branches of the secondary radio station 5 is well known and not shown in details here". In addition, Applicant's specification page 6, lines 10-12 disclose that "the signal circuit 210 and 220 can be transmitter, receiver, or transceiver").

Regarding claim 25, Rapeli further teaches the multiple antenna system is adaptable for use in a cellular telephone (see fig.4, and column 3, lines 52-54, see "secondary radio station" and see column 1, lines 28-32).

Regarding claim 29, Rapeli further teaches the first impedance matching circuit matches an impedance of the second antenna (see column 6, lines 11-15, "which used to match one antenna at a time to the transceiver circuit" and fig.4, "matching

impedances" of Zm1 and Zm2) in multiple frequency bands (see fig.6, frequencies f1 and f2).

Regarding claim 30, Rapeli further teaches the first impedance matching circuit includes a selectable impedance (see column 6, lines 8-9, "switches 62 and 63 for switching matching impedances Zm1 and Zm2).

Regarding claim 40, Rapeli further teaches the second signal circuit generates signals in multiple frequency bands (see fig.6, frequencies f1 and f2).

Regarding claim 41, Rapeli further teaches the first parallel tuning circuit increases isolation between the first and second antennas in multiple frequency bands (see column 4, lines 57-67).

Regarding claim 55, Rapeli further teaches the first and second antennas are simultaneously operatively connected to respective first and second signal circuits via respective first and second signal paths (see column 5, lines 63-65, "receive and transmit branches of the secondary radio station 5 is well known and not shown in details here". In addition, Applicant's specification page 6, lines 10-12 disclose that "the signal circuit 210 and 220 can be transmitter, receiver, or transceiver").

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 5, 6, 15, 16, 21, 27, 45, 46 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rapeli et al (US 6,195,559).

Regarding claims 5 and 6, Rapeli teaches the multiple antenna system (see fig.4, antenna 30-34). Rapeli does not specifically disclose the first and second signal circuits generate signals at unique frequencies or the first and second signal circuits generate signals at the same frequencies as claimed. However, using the first and second signal circuits generate signals at unique frequencies or the first and second signal circuits generate signals at the same frequencies are known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Rapeli as claimed, in order to improve the first and second signal circuits generate signals at unique frequencies or the first and second signal circuits generate signals at the same frequencies.

Regarding claims 15, 16, 45 and 46, Rapeli teaches the multiple antenna system (see fig.4, antenna 30-34) and a first parallel tuning circuit selectively connectable in parallel to the second signal path (see fig.4). Rapeli does not specifically disclose a second parallel tuning circuit selectively connectable in parallel to the second signal path. However, those skilled in the art thus would appreciated that the teaching of Rapeli could be modified such as a second parallel tuning circuit selectively connectable in parallel to the second signal path without changing the scope and spirit of Rapeli's invention.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Rapeli in order to control the electromagnetic coupling in a second parallel tuning circuit (see Rapeli, column 4, lines 57-67).

Regarding claims 21 and 50, Rapeli teaches the multiple antenna system (see fig.4, antennas 30-34), wherein the first tuning-circuit includes a first band tuning circuit having an impedance (see fig.4, antenna 34 and parallel tuning circuit Zm1 and Zm2).

Rapeli does not specifically disclose the first tuning circuit includes a first band tuning circuit having an impedance matched to the second antenna and a second band tuning circuit having an impedance matched to a third antenna.

However, those skilled in the art thus would appreciated that the teaching of Rapeli could be modified such as the first tuning circuit includes a first band tuning circuit having an impedance matched to the second antenna and a second band tuning

circuit having an impedance matched to a third antenna without changing the scope and spirit of Rapeli's invention.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Rapeli in order to control the electromagnetic coupling a second band tuning circuit having an impedance matched to a third antenna (see Rapeli, column 4, lines 57-67).

Regarding claim 27, Rapeli teaches a parallel tuning circuit (see fig.4, antenna 34 and parallel tuning circuit Zm1 and Zm2) further comprising: a first impedance matching circuit (see fig.4, antenna 34 and parallel tuning circuit Zm1 and Zm2), and a first switch (see fig.4, switches 62 and 63) selectively connecting in parallel the second impedance matching circuit with a transmission line connecting a the first antenna to a the first signal circuit (see fig.4). Rapeli does not specifically disclose the a second impedance matching circuit; and a second switch selectively connecting in parallel the second impedance matching circuit with a transmission-line connecting a the second antenna to a the second signal circuit.

However, those skilled in the art thus would appreciated that the teaching of Rapeli could be modified such as the a second impedance matching circuit; and a second switch selectively connecting in parallel the second impedance matching circuit with a transmission line connecting a the second antenna to a the second signal circuit without changing the scope and spirit of Rapeli's invention.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Rapeli in order to control the

electromagnetic coupling in a second parallel tuning circuit (see Rapeli, column 4, lines 57-67).

7. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rapeli et al (US 6,195,559) in view of Harzer (US 3,681,706).

Regarding claim 31, Rapeli teaches the parallel tuning circuit (see fig.4, parallel tuning circuit Zm1 and Zm2). Rapeli does not specifically disclose the selectable impedance is digitally selectable.

Harzer teaches the selectable impedance is digitally selectable (see column 15-21).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Harzer into the system of Rapeli in order to provide an improved frequency-control system of the general type described which eliminates this so-called digital error so as to allow a more exact oscillator adjustment (see Harzer, column 1, lines 55-59).

8. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rapeli et al (US 6,195,559) in view of Nakanishi (US 6,215,456).

Regarding claim 32, Rapeli teaches the parallel tuning circuit (see fig.4, parallel tuning circuit Zm1 and Zm2). Rapeli does not specifically disclose the first impedance matching circuit dynamically adjusts impedance based on external interference.

Nakanishi teaches the first impedance matching circuit dynamically adjusts impedance based on external interference (see column 8, lines 52-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Nakanishi into the system of Rapeli in order to improve signal quality.

9. Claim 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rapeli et al (US 6,195,559) in view of Berglund et al (US 5,596,313).

Regarding claims 53 and 54, Rapeli teaches the multiple antenna system (see fig.4, antennas 30-34). Rapeli does not specifically disclose the first antenna is disposed proximate said second antenna to within approximately one wavelength or less.

Berglund teaches the first antenna is disposed proximate said second antenna to within approximately one wavelength or less (see column 5, lines 4-20 and see fig.5a).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Berglund into the system of Rapeli in order to allow the security personnel carrying the portable monitor to further define the location operati (see Berglund, column 5, lines 9-12 and see fig.5a).

#### ***Allowable Subject Matter***

10. Claims 33-38 and 56 are allowed.

The following is an examiner's statement of reasons for allowance:

Claims 33 and 56 are allowable over the prior art of record for the reasons as stated in the Applicant's Remarks dated 06/30/2004 (pages 5-7).

Dependent claims 34-38 are allowable for the same reason.

***Response to Arguments***

11. Applicant's arguments with respect to claims 1-32 and 39-55 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

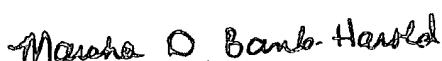
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nghi H. Ly whose telephone number is (703) 605-5164. The examiner can normally be reached on 8:30 am-5:30 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nghi H. Ly

  
10/05/04



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